1978

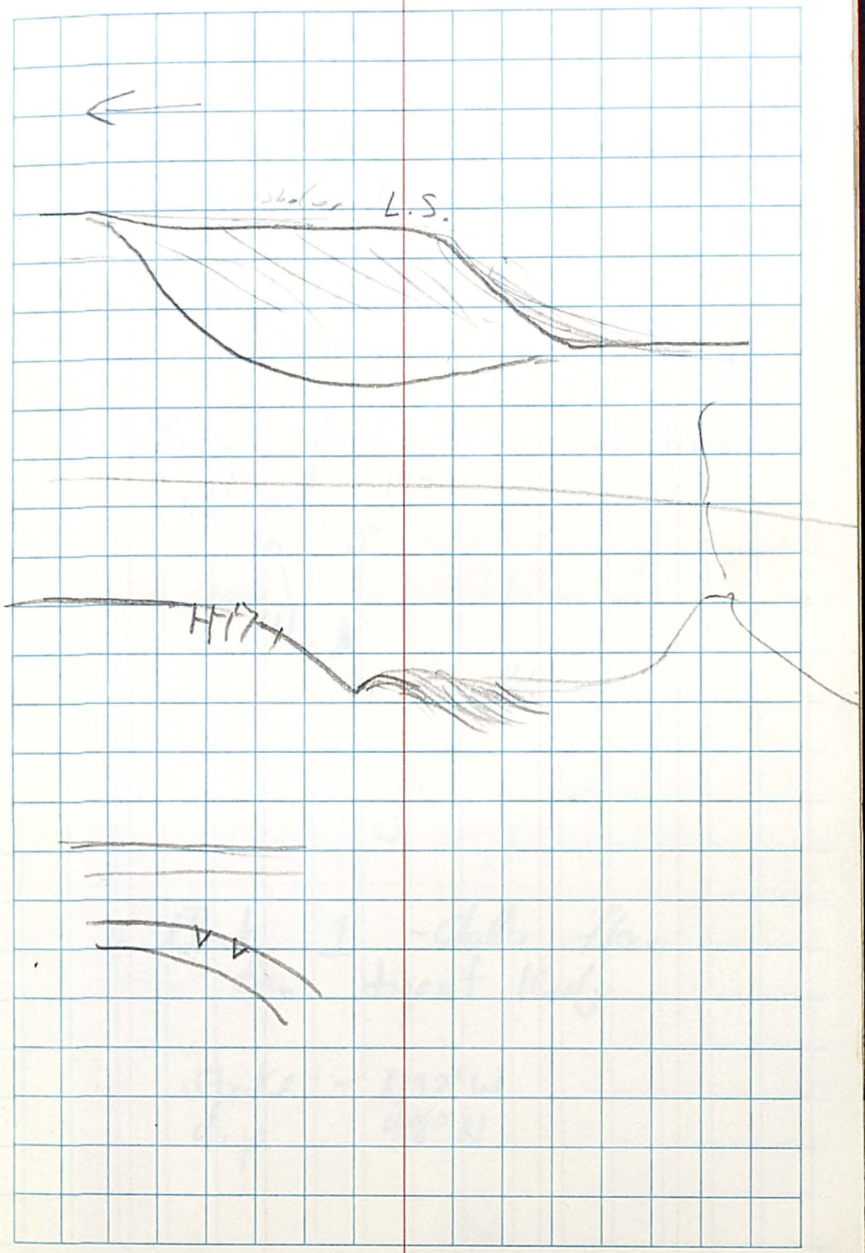
Kodama Field Notebook #1

Kenneth P. Kodama
Lehigh University

First 3 shots
camp
7-13-78
1. Anderson Creek
- Anderson Canyon
- White Hills - Looking West.

2. Ice channel
- drainage channel
Near Challis Volcanics

New roll
1. Indian Paintbrush
2. Art Hill
3. Anderson Canyon - looking south
4. outwash channel in Challis
& Anderson Canyon

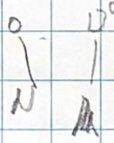

L.S.

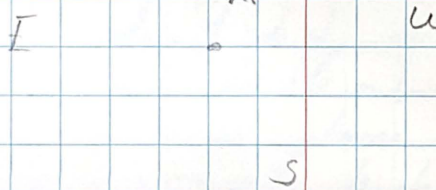
July 15, 1978

1. on rt side of Deer Creek as you head up stream

2. on high Challis Knob
Volcanics dipping steeply

3. Make declination correction!
set at 13°





4. Block I - Challis flows
from top of Knob

Strike - N92°W
dip 48° N

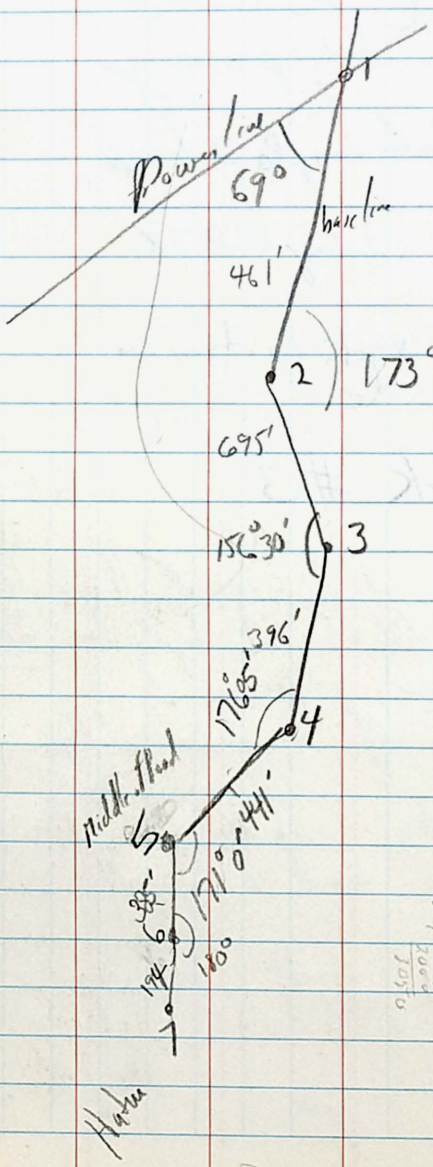
July 21, 1978

up Little Beaver Creek
west side canyon
~ 1/4 mile from road

Chalk flow
- grungy
- weathered
no apparent flow structure
- large feldspars
- perhaps vertical bedding
probably jointing
- doesn't expect good results
- characteristic - bumpy weathering
in some places.
- relatively high bare ridge.

- will take one sample for
stability studies

- moved north because
of obvious lighting
strike


Power line
69°
461'
1
2
173° 50'
695'
156° 30'
3
396'
176° 30'
4
Middle Road
5
411'
171°
6
38'
180°
7
Harbor

April 7, 1979

Gravity Survey

Mt. Ivy.

start at pole #14

Station 1

Init Height 104.9'

elevation = 100'

Station 2

461' High spot Between 2 bodies of water

elevation = 101.08'

695' Station 3 elevation 97.98' other side of water

396' Station 4 elevation 96.70'

441' station 5 96.80' Middle of Road

385' station 6 100.80' in field

194' station 7 97.80' edge of swamp

2.7
216 | 590
432
1580
1512

Station 8 - near pond in Day Camp

elevation 115.80'

640'

Station 9 (on 140' contour) - at T intersection in Day Camp

132.30'

590'

Station 10 at Baldpate N.T in Cul de Sac in Day Camp

126.35'

Nov 2, 1979

Hamburg Klippe
Fetzer's studs

Some disturbation

Rt. 143 - near Kempton

Drew brittle hard to sample

Rock #1 - very brittle - Pre intrusive age - at road cut

S- N87W 22SW

Rock #2 Downslope - toward Maiden Creek from Rock #1

Windsor Township
Fm. - Red beds

Site GLK-468

Weed Strike & dip
N86E 66SE

GL/HB-68

Greywacke

upside down

#3 – background

– olivine

Slipped into slide unit

50- NGYE 48SE

upside down –

~~#4 Look back near Raider creek – bridge out near outcrop #3.~~

#5 Greywacke

from RT 183
just s. of Coalmont sville.

all coal thrown ~~from~~ Hawksnest Slope

W.T.F

Rt side up
Strike N73E
SE51°

#6

gray wacke

Right side up

RT/B

N73E

35SE

#7 Red beds,

old Railroad bed

on Maiden creek

South Orogenic belt

Tectonic unit

N73E

30 SE

#8 Rockcut
up on Road
near 7

Red bed fracture
tectonic suit as 7

Strike N78E
46SE

#9 50-N81W 68SW
along old Rd ~ 1.5
km east of
Lenhartsville

#10

W57E
68 NW
R5 Op.

1.5 km E of Kleinsville

Sample 7 - 3 samples

7-1 α = N75E
β = +28.5°

7-2 α = N75E
β = +29°

7-3 α = N74E
β = +30°

Sample 9 - 3 samples

9-1 α = N90E
β = +3°

9-2 α = ~~N90E~~ N275E
β = -9°

9-3 α = N90E
β = +8°

10-1 $\alpha = N91E$ - 1 sample

$\beta = +33°$

10-2 $\alpha = N88E$

$\beta = +35°$

8-1 $\alpha = N78E$ 1 - sample

$\beta = +37.5°$

8-2 $\alpha = N51E$ $\beta = +57°$

3-1 $\alpha = N70E$

$\beta = +37.5°$

3-2 $\alpha = N70E$

$\beta = +37.5°$

3-3 $\alpha = N68E$

~~3-4~~ $\beta = +37.5°$

3-4 $\alpha = N70E$

$\beta = +37.5°$

5-1 $\alpha = N\ 72\ E$

$\beta = 30°$

5-2 $\alpha = \sim\!\!\sim\!\!\sim$ N 65 E

$\beta = \sim\!\!\sim$ + 34°

Samples from 7 [1, 2 & 3]
- from old railroad bed
Strike 73
dip 50

8 - 1 sample
Strike 78
dip 46

Same tectonic unit

Samples from 9, [1, 2 & 3]
from old Route 22
Strike 99
dip 68

Sample from 10 (1)
Strike 237
dip 68

Same tectonic unit

Unit 5 - Graywacke (4 samples)
S. of Lobbhartsville

Strike 73
dip 51

Unit 3 Graywacke (3 samples)

(upside down)
↑ Strike 64
dip 48

all from 1st outcrop

March 20, 1980

outcrop 1

Sample 1

$\alpha = N81E$
$\beta = +54°$

perhaps off on orientation by 5°

Rock 2 is from outcrop 1
Mid part

Rock 3 right above rock 2
in outcrop 1

Rock 4 - about 100' W of 2 & 3 - just N of creek

5 - right above #4

6 from outcrop 1
~200' N of #5

7 20' down from 6

8 - block from just below site 9 of previous sampling trip

Near Louisville old 22

block 9 from 1 mile E of Kleinsville near guy in bus

block 10 - directly ~~next to~~ (within 2")

Blocks 11, 12, 13
all from cor of dirt road
1.5 mile E of Kinsville

Block 14 right next
along dd road
bed along
Maiden creek
- I believe dd rite
7

Block 15
- right on creek
about 100' from
block 14

Block 2

Sample 2-1 α N66E ← IRM?
$\beta = 41.5$

2-2 α N93E ← IRM?
$\beta = 40°$

Block 3

3-1 α = N98E ← IRM?
$\beta = 39°$

3-2 $\alpha = 254$ ← No IRM
$\beta = 15.5$

Block 5

5-1 $\alpha = 87°$; $\beta = 49°$

5-2 $87° = \alpha$; $\beta = 49.5°$

5-3 $\alpha = 88°$
$\beta = 48.5°$

Block 6

6-1 $\alpha = 89°$
$\beta = 44°$

6-2 $\alpha = 87.5$
$\beta = 42$

6-3 $\alpha = 87°$
$\beta = 41.5$

Block 8

No good

Block 9

9-1 $\alpha = 69$ $\beta = 43$
9-3 $\alpha = 63.5$ $\beta = 40.5$
9-2 $\alpha = 62$
$\beta = 40.5$

10-1 $\alpha = 86°$ $\beta = 52.5$

10-2 $\alpha = 80°$ $\beta = 32°$

13-1 $\alpha = 85°$
$\beta = 88°$
No factors correction - bedding is horizontal

13-2 $\alpha = 82°$
$\beta = 85°$
No factors correction bedding is horizontal

13-3 $\alpha = 89°$
$\beta = 89.5$
No factors correction

13-4 $\alpha = 83°$
$\beta = 89°$
No factors correction

Block 15

strike W 73° E
dip 61.5° SE

15-1 $\alpha = 89°$
$\beta = 46°$

15-2 $\alpha = 87°$
$\beta = 45°$

15-3 $\alpha = 82.5°$
$\beta = 44.5°$

all glued together

15-4 $\alpha = 86°$
$\beta = 42°$

unbroken sample but top exposed to slant of screwdriver

14-1 $\alpha = 75°$
$\beta = 41.5°$

strike N 73° W
dip 55° SE

Badly broken up

14-2 $\alpha = 89°$
$\beta = 40.5°$

Trip #3

Marcher cycles

block #1

Strip N 70 E (1)

dike 51 SE

Block #2 + 3

N 71 E 64 SE (2+3)

Block #4

N 62 W (4)

298 Strike

41 SW - Dip

Trip 3

Maiden Creek

Block 1

	S	D
	N70E	51SE

Sample 1-1

$\alpha = 54°$

$\beta = 36°$

Sample 1-2

$\alpha = 52.5°$

$\beta = 40°$

Sample 1-3 $\alpha = 52°$

$\beta = 40°$

Block 2

from new block -

	S	D
	N71E	64SE

Sample 2-1 $\alpha = 60°$

$\beta = 36°$

2-2 $\alpha = 58°$

$\beta = 38.5°$

2-3 $\alpha = 57°$

$\beta = 38.5°$

Block 4 - S N62W D 41SW

Near slice at eastern end

4-1 - α = 121°
β = 56°

4-2 - α = 117°
β = 56°

4-3 - α = 116°
β = 55.5°

Field trip June 3, proposed collection scheme.

site → large outcrop

1st site (on right)

need 3 blocks - ~~6 samples~~

2nd site (middle)

3 blocks - ~~6 samples~~

3rd site 3 blocks - ~~6 samples~~

Long Slice

old 22

need 3 blocks ~~6~~ samples 6

Guy near Bus

- need 3 blocks ~~3 rock~~ 6

Old County Rd → 3 blocks 6 ~~need 3 samples~~

Maiden Creek

1. need ~~6~~ 3 from near Railroad Load
2. need 3 from near River
3. need ~~3~~ from by Road

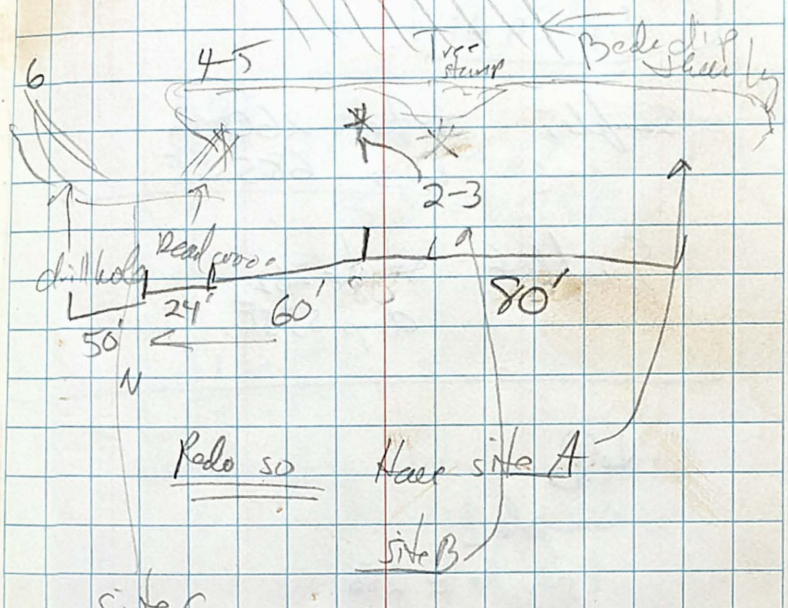
from last two blocks,
need 2 hand samples each
3 samples from each
block.

Old need
at least 5 from each limb.

52 samples

June 3, 1980

"Bedrock" Sample from Windsor area



Redo SO

Near site A

Site B

Site C

Site A — 6 samples

Sample 1

Strike 60
Dip 12
Strike = 60
Dip = 11.5

Sample 2 (directly below sample 1)

Sample 3 (from near 1 & 2)

Loose rocks

Sample 4
strike 265
dip 58 S

Sample 5 strike 260
Dip 68.5 SE

Sample 6 strike 262
dip 55 SE,

Site B

Sample 1
strike = 256
dip = 46 SE

Sample 2
strike = 254
dip 51.5°

Sample 3 from
directly below 2

4B
from same group
as 2B & 3B

5B strike 247
dip = 40 SE

Side C

two sample from
near dead tree (talk.)
sample 4-5 old trip
here.

Sample 1 strike = 280
dip = 46.5

Hand Sample

Sample 2 — from directly
below 1

3C very near
to 1C & 2C

4C Strike 260
dip 50 SE

from near
sample 6
feet
to west

Long Slice
along old 22

1st Site

along old 22
– call it site D

Sample 1 strike 95
dip 71.5 SW

Sample 2 – same
1

105 east along old Rd.
Sample 3

Sample 4

Sample 5

all together

– along strike
approx with other

Site E 950' E. of Log old 22 Rd. old guy + bus

to be combined w/ old guy in block out crop

strike=94
dip=37.5 S 1E (very small)

2E from near guy w/ bus

all from guy w/ bus sit

below 3E
about 4E
} right next to each other

- 4E was originally as a piece of 3E

strike=275
dip=47.5 S.

5E

Sit in middle of county rd

1F

2F

X 3F

Strike = 274

dip = 245

Specimens

Site A → large block

Sample 1A

Specimen 1-A-1 — had to use clamp, screwdriver to displace — fold (.05 se)

$\alpha = 90$

$\beta = 26$

2-A-1 $\alpha = 81$ $\beta = 25$ — screw driver used —

3A-1 $\alpha = 85$ $\beta = 22.5$

3-A-2) — same curve as 3-A-1

4-A-1

$\alpha = 80$

$\beta = 31.5$

No screw driver

5-A-1

$\alpha = 88$

$\beta = 28$

6-A-1

$\alpha = 31$

$\beta = 31$

problem w/ orientation

No screwdriver

Note: screwdriver bar, field of 50008's at top 5% of loc.

Site B large outcrop to the left of the road when facing from road

1-B-1 $\alpha = 96$ screwdriver
$\beta = 66.5$

2-B-1 ~~$\alpha = 89$~~ ~~$\beta = 26$~~ screwdriver used
$\alpha = 62$
$\beta = 49$

3-B-1 $\alpha = 84°$ screwdriver used
$\beta = 30°$

4-B-1 $\alpha = 81°$ screwdriver
$\beta = 36.5°$

5-B-1 $\alpha = 55$ screwdriver
$\beta = 60$

Site C

1C-1 $\alpha = 98$
$\beta = 59$ screw dislocation

2C-1 $\alpha = 94$ screw dislocation + green stringer
$\beta = 41$

2-C-2 $\alpha = 102$
$\beta = 55$

3C-1 $\alpha = 84$
$\beta = 56$ screw dislocation pattern part

4C-1 $\alpha = 86$
$\beta = 44$ screw dislocation created by shrinkage

Site D 0122 site

1-D-1 $\alpha = 100°$ $\beta = 27°$ screwdriver bottom half

2-D-1 $\alpha = 87$ $\beta = 27$ Strike = 95 dip = 72 S

Strike = 60 dip = 47 S East 3-D-1 $\alpha = 61$ $\beta = 46$

4-D-1 $\alpha = 64$ $\beta = 56$ No screwdriver Strike = 60 dip = 35 S

measured a bit too small

5-D-1 $\alpha = 60$ $\beta = 56$

Strike = 68 dip = 42 S

Site E (from middle of Log Slope / from heading on top / other 4 from gap near base)

	α	β	Strike	dip	
1 E1	~~55~~	~~51~~	use		
upstairs	35	74	Measured for outcrop		
2 E1	104	57	270	39	S
checked upstairs ✓ OK					
3 E1	128	51	270	74	S
4 E1	115	36	273	67.5	S
5 E1	139	76	use 275	47.5	S

Site E

	α	β	Str.	Dip
1-F1	77	48	81	45 S
2-F-1	207	72	80	40 S
3F-1	98	55	90	35 S
4-F-1	83	43	81	55
5-F-1	118	64	99	26

Sampling Trip

1. collect more sample (blocky) from site B
1 or 2

2. collect 6 sample from
fold

3. collect

8-20-80

Field sampling

attempt to get sample from
100 ft limits of field in a redbud.

location southern roadcut of two
NW of Lewistown on
PA 143
→ have tried to find a suitable
field on east side of road
- folds are too small -

I will attempt to sample a field on
west side of road near northern
end of southern roadcut at lower.

all samples designated F have been changed to G Sept 15, 1980

F3 strike 296
Dip 52 NE

- Mineralization - fine horizontal

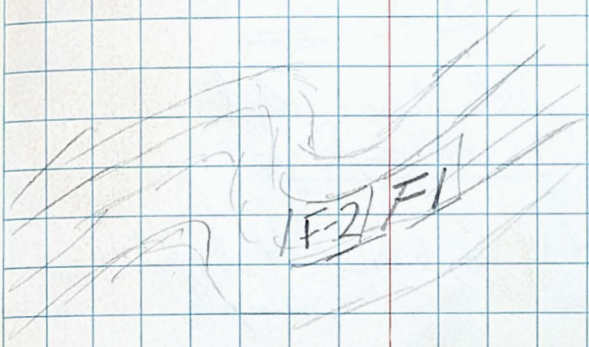
azimuth = 314°

F4 strike = 305°
dip = 60° NE

dips to NE 59°

F4 - broken off bottom of F4

fold appears thusly:



actually structures seen here are folded chert beds with the red ones

F1 Strike & dip N103E
Dip = 10.3° SW

F2 S = N106E
D = 11° SW

F2 - broken off part of F2

Fault separated

Closer to fold axis

re occupying site
near old abandoned
school house

- problem here is that
rx are very fissile

will try to take 4 hand
samples

1 strike = 227.5°
dip 60 SE

orientation
— line is horizontal
on roadside of road
- azimuth = 227.5
like dips SE
at 60 to 50
lines are underscored

Sample 2

Strike = 257

dip = 71 SE

orientation line azimuth

N 81° E

⊥ line dips

67.5° SE

Sample 3

Strike 235

dip 65.5 SE

orientation line

azimuth 64°

dip 66°

SE

From the Fold

Sample G1 (formerly F1)

$\alpha = 11.5°$

$\beta = 80.25$

Sample G2 (formerly F2)

$\alpha = 67.5$

$\beta = 72.5$

Sample G2' (formerly F2')

$\alpha = 325°$

$\beta = 71°$

G 4' (formerly F4')

$\alpha = 280°$

$\beta = +4.5°$

G3 (formerly F3)

$\alpha = 283.5$
$\beta = +19.5°$

G4 (Formerly F4)
$\alpha = 298$
$\beta = 28.5$

H1 & H2
are from the very first outcrop collected on the first sampling trip -

They are from the same tectonic block as the samples in the fold test.

H1 $\alpha = 82°$ (Slim hand sample)
$\beta = 18.5°$

H2 $\alpha = 86$
$\beta = 22.5$

From separate block

sample I 1 (from block 1)

$\alpha = 215$

$\beta = -16.5$

strike 227.5

dip 60 S.E.

sample I 2

$\alpha = 78$

$\beta = 23$

I 3

$\alpha = 83$

$\beta = 18.5$

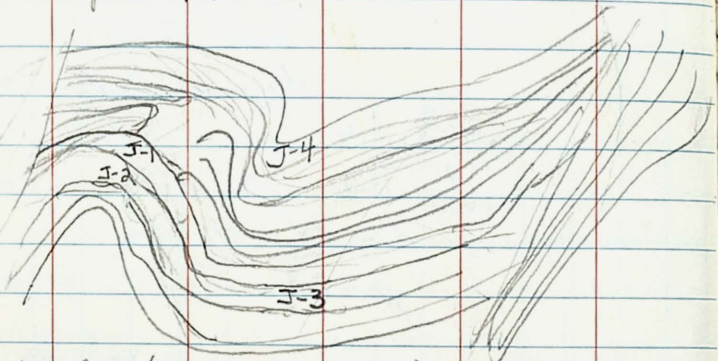
Nov 22, 1980 resampling fold

Site J — strong mix of red and green ~~rocks~~ —

sample J-1 from fold

strike = 291.5°

dip = 53° NE



sample J-2 from fold (directly beneath J-1)

strike = 302.5°

dip = 56° NE

sample J-3 from fold (same bed as J-2)

strike = 56° } [taking rock out and

dip = 16.5° SW } [measuring surface below]

sample J-4 from fold ((top of fold) J-5)

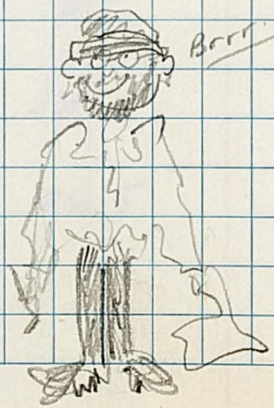
strike = 96°

dip = 16.5° S

Site → "man with truck"

sample K. from outcrop- (K, K')
strike = 295°
dip = 48° SW

sample L (from outcrop)
strike = 295°
dip = 39° SW



J-1

	α	β
a	304	31.5
b	307	31
c	305	33.5

J-2

	α	β
a	309.5	32.5
b	306	28
c	306.5	26.5

sc vuelve a ver

sc vuelve a ver

V-3	α	β
a	60	72.5
b	63	71
c	65	69

V-4	α	β
a	102	66
b	89	71
c	113.5	65.5

Sample L

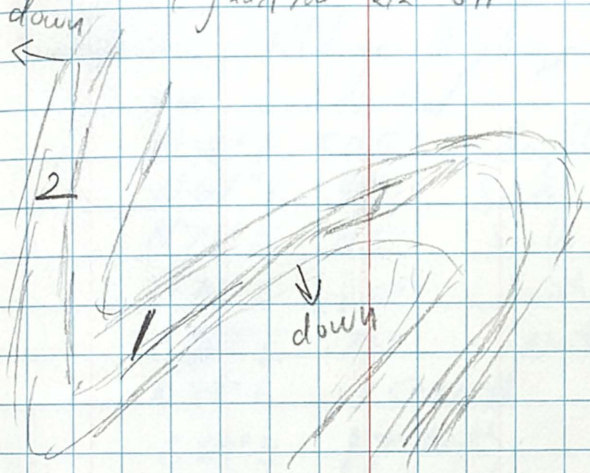
	α	β
1	110	60
2	111	54
3	108	49

15'

	α	β
1	122	49
2	128	47
3	135	46

K	α	β
1	142	53.5
2	143.5	52.5
3	142.5	52.5

Folding Collinsville March 18, 1982
at junction 212 & 611



1 strike = 238° N58E45SE
dip = 45°S

line a N53°E

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2 strike = 225°
dip = 86°S ← overturned

line a = N295°E
N45E 86SE

April 21, 1986 – Lerdi Quar.

Oolitic layer above calcite marble bed

- deformed fold axis * plunge on oolitic bed

N 76° E	50.5°	South
N 67° E	48°	South
N 72° E	29.5°	South *
N 70° E	22.5°	South *
S 62° E	27.5°	North
N 84° E	13.5°	North
S 69° E	17°	North
W 62° W	13°	North
S 64° E	30°	North

* Nitfrom oolitic layer

4-24-86

- Leech Quarry 10.02 for
  facing west - at anticline

- working on south-dipping limb

- will process oriented hand samples

- strike & dip of hand sample

- strike N 66° E
  N 70° E
  N 64° E
  N 64.5° E
  } 66.1°

  dip 46.5° S
  46° S
  46.5° S
  } 46.3°

Sample A

lineation (slickensides)
on bedding surface
N 29.5° W
43° S

Sample A 4" thick
⊥ to bedding

- base of sample A

5.5" above top of white marker bed

A-A$_2$ = N74°E
β = 41.5°

A-B α = N73°E
β = 41°

A-C α = N75°E
β = 41.5°

Sample B on northeast dipping limb

Base of sample 5" above top of white marker bed

Strike S60°E 28°N) 27.3
S60°E 26.5°N)

orientation line points N39°E and is horizontal
⊥ line dips 78°SE

- after all the hassle of getting this sample - unfortunately very few oolites

~~Ltie~~

BA $\alpha = N63°W$
$\beta = 73°$

BB $\alpha = N54°W$
$\beta = 76°$

BC $\alpha = N61.5W$
$\beta = 58°$

Fortunately 8" below
is a heavily oolitic
layer - we will
sample this layer
& compare to B

C Strike S72°E
dip 29° N

orientation line pts
S80°E
⊥ dips 82.5° S

CA $\alpha = S20°E$
$\beta = 10.25°$

CB $\alpha = S16E$
$\beta = 9°$

CC $\alpha = S14E$
$\beta = 5°$

Block D

on south dipping limb
- some oolitic layers, samples Block A

5° down dip from A

strike N 80° E
57.5° S

just up where sample comes from
strike N 78° E
dip 47.5° S ← use this

orientation line
N 30° W
dip 81.5° E

DA α = N 81.5° E
β = 41°

DB α = N 80° E
β = 39.5°

Block E

Line pts N 28° W
dip 78.5° NE

FA α = N 9° W
β = 13.5°

EB α = N 11.5° W
β = 14

Strike N 75° E
dip 33.5 N W

line on fl. section
dips 3° to W

Oct 27, 1964

Vetter Reconnaissance sampling

Chickies Quartzite

-Quarry

1 α N46°E
β = 39°

2 α N3°E
β = 10°

} from cliff face ~300' apart

N72°E
32°W

3 α N24W
β = +24

oriented hand specimen

→ S69W/49S

across river from Chicken Rock (on road to Arrow Ac Camp)

4 $\alpha = S69°W$
$\beta = 19°$

5 $\alpha = N79°W$
$\beta = 9°$

Probably metabasalt etc
bedding / (s.l. to 17)

N65E/53S

Spinnerstown Diabase

A α N30°W
β = 61°

B α = N87W
β = 48°

C α = 05°E
β = 32

Cricket rock N78E
33W
(hand sample)

25-30' FROM CONTACT

#1	S 36 E	34°
#2	S 3 E	59°
#3	S 60 E	35
#4	S 38 E	58°
#5	S 49 E	69°
#6	S 58 E	40
~~#7~~	~~S 38 E~~	

BRASS RODS
RX DRILL

C-1	314	80 E
C-2		
D-1	135	21°
D-2	132	14°
D-3	108	35°

Argentine basalts

Flat rock

Note: no declination correction made - oriented by magnetic N in Argentina

FR-1

$\alpha = 57^\circ$

$\beta = 85.5^\circ$

LR-1

$\alpha = 2^\circ$

$\beta = -3^\circ$

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declination is about 11° E for that part of Argentina

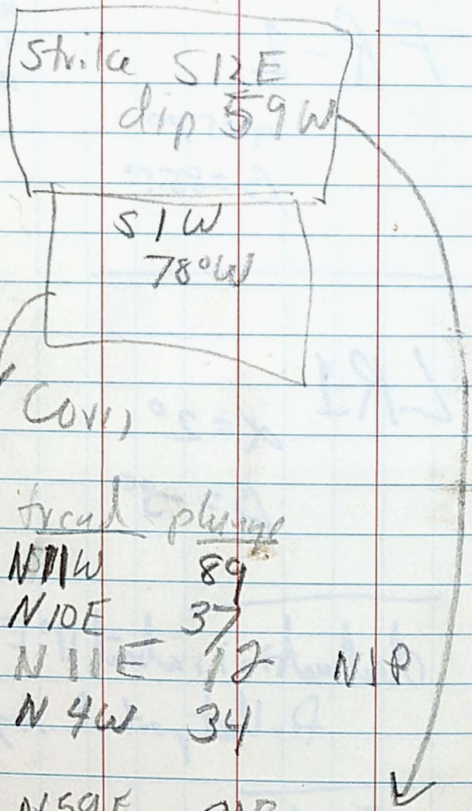
So FR-1

$\alpha = 46$ $\beta = 85.5$

LR-1 $\alpha = 351$ $\beta = -3^\circ$

4-2-93

Loudoun, VA
Horntown side
Road F100W - Near
Goose Creek Country
Club Parkway



	Circuit	plunge	
Core 1	N11W	89	
Core 2	N10E	37	
Core 3	N11E	12	N1P
Core 4	N4W	34	
5	N59E	31°	
6	N40E	38	
7	N50E	16	

June 5, 1947

I-280 Newark rock cut.
- north side 280 - E of Parkway (1st site)

(1) N52°E
dip SE 76°

(2) N68°E — same as cut of previous drill core
dip 72°SE

(3) N5°E strike
75°E dip

(3A) Mark transferred to — magnet does not accurately as (3)

(4) S 88° E
90° SW

(7) S60W
11°NW

(5) N54°E
72°SE

Strike N58°E
8°NW

West of Parkway on
I-280
near Central Ave. Orange
exit ramp west

(8) S53E
23SW

(9) N58E
7°NW (bedding surface)

Gravity June 22, 1982

Lehigh Base
7:52 AM EDT

Worden Master # 733
904.3

12:22 PM EDT Burlington base

1835.7

dial constant
at 92° F
= 0.08912

To do

1. collect Cambrian samples if possible. 1 day
2. collect rx from Ujuaci area for stability studies. 1 day
3. see Paleozoic section in S.W. of Ca Basin. 1 day
4. No. thereby (Challis)?
5. Ask Ed about glacial silt bars for camping.

1. Wildhorse – pE. & Monzonite. in (2 days)
2. Ketchum – San Valley again? 1 day
3. Mackay. 1 day

Alice & Cities Sheep areas

4. PB. & I take horses out

1. Cambrian (?)
2. collect rx from Ujuaci area
3. ~~dig~~ Wildhorse.
4. Mackay.

N65E/535

Table I. — Tangents and Externals to a 1° Curve. Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
1°	50.00	.22	8°	400.66	13.99	15°	754.32	49.44
10′	58.34	.30	10′	409.03	14.58	10′	762.80	50.55
20	66.67	.39	20	417.41	15.18	20	771.29	51.68
30	75.01	.49	30	425.79	15.80	30	779.77	52.82
40	83.34	.61	40	434.17	16.43	40	788.26	53.97
50	91.68	.73	50	442.55	17.07	50	796.75	55.13
2	100.01	.87	9	450.93	17.72	16	805.25	56.31
10	108.35	1.02	10	459.32	18.38	10	813.75	57.50
20	116.68	1.19	20	467.71	19.06	20	822.25	58.70
30	125.02	1.36	30	476.10	19.75	30	830.76	59.91
40	133.36	1.55	40	484.49	20.45	40	839.27	61.14
50	141.70	1.75	50	492.88	21.16	50	847.78	62.38
3	150.04	1.96	10	501.28	21.89	17	856.30	63.63
10	158.38	2.19	10	509.68	22.62	10	864.82	64.90
20	166.72	2.43	20	518.08	23.38	20	873.35	66.18
30	175.06	2.67	30	526.48	24.14	30	881.88	67.47
40	183.40	2.93	40	534.89	24.91	40	890.41	68.77
50	191.74	3.21	50	543.29	25.70	50	898.95	70.09
4	200.08	3.49	11	551.70	26.50	18	907.49	71.42
10	208.43	3.79	10	560.11	27.31	10	916.03	72.76
20	216.77	4.10	20	568.53	28.14	20	924.58	74.12
30	225.12	4.42	30	576.95	28.97	30	933.13	75.49
40	233.47	4.76	40	585.36	29.82	40	941.69	76.86
50	241.81	5.10	50	593.79	30.68	50	950.25	78.26
5	250.16	5.46	12	602.21	31.56	19	958.81	79.67
10	258.51	5.83	10	610.64	32.45	10	967.38	81.09
20	266.86	6.21	20	619.07	33.35	20	975.96	82.53
30	275.21	6.61	30	627.50	34.26	30	984.53	83.97
40	283.57	7.01	40	635.93	35.18	40	993.12	85.43
50	291.92	7.43	50	644.37	36.12	50	1001.7	86.90
6	300.28	7.86	13	652.81	37.07	20	1010.3	88.39
10	308.64	8.31	10	661.25	38.03	10	1018.9	89.89
20	316.99	8.76	20	669.70	39.01	20	1027.5	91.40
30	325.35	9.23	30	678.15	39.99	30	1036.1	92.92
40	333.71	9.71	40	686.60	40.99	40	1044.7	94.46
50	342.08	10.20	50	695.06	42.00	50	1053.3	96.01
7	350.44	10.71	14	703.51	43.03	21	1061.9	97.57
10	358.81	11.22	10	711.97	44.07	10	1070.6	99.16
20	367.17	11.75	20	720.44	45.12	20	1079.2	100.75
30	375.54	12.29	30	728.90	46.18	30	1087.8	102.35
40	383.91	12.85	40	737.37	47.25	40	1096.4	103.97
50	392.28	13.41	50	745.85	48.34	50	1105.1	105.60

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
5°	T=.02	.03	.05	.06	.08	.10	.11	.13	.15	.16	.18	.20	.21	.23
	E=.000	.000	.001	.001	.002	.002	.002	.003	.003	.004	.004	.004	.005	.005
10°	T=.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
	E=.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	T=.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.53	.58	.63	.68
	E=.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	T=.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
	E=.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	T=.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
	E=.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135

~~A1609E/34~~ Cypress

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